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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/729,102	12/05/00	KIDA	199584US0 CO

022850
OBLON SPIVAK MCCLELLAND MAIER & NEUSTADT
FOURTH FLOOR
1755 JEFFERSON DAVIS HIGHWAY
ARLINGTON VA 22202

IM62/0313

EXAMINER	
VERSTEEG, S	
ART UNIT	**PAPER NUMBER**
1753	4

DATE MAILED: 03/13/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/729,102	KIDA ET AL.	
	Examiner	Art Unit	
	Steven H VerSteeg	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15)☒ Notice of References Cited (PTO-892)
16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18)☐ Interview Summary (PTO-413) Paper No(s). _____ .
19)☐ Notice of Informal Patent Application (PTO-152)
20)☐ Other:

DETAILED ACTION

Oath/Declaration

1. Receipt is acknowledged of papers filed under 35 U.S.C. 119 (a)-(d) based on an application filed in Japan on 25 March 1998 (i.e. the PCT application). Applicant has not complied with the requirements of 37 CFR 1.63(c), since the oath or declaration does not acknowledge the filing of the PCT application. A new oath or declaration is required in the body of which the present application should be identified by application number and filing date.

Specification

2. The disclosure is objected to because of the following informalities: the status of the parent application needs to be updated on page 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has provided the limitation "2 to 10 nm" in line 2 of the claim, but the specification provides support for the limitation "2 to 10 **mm**" (emphasis added). Therefore, the subject matter is considered to be new and must be canceled. It is recommended that Applicant amend the claim to change "nm" to "mm" to overcome the rejection.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 12-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 12 recites the limitation "the main component" in line 5. There is insufficient antecedent basis for this limitation in the claim.

8. Claims 13-20 depend from claim 12 and contain all of the limitations of claim 12. Therefore, claims 13-20 are rejected for the same reasons as claim 12.

9. Claim 21 recites the limitation "the main component" in line 5. There is insufficient antecedent basis for this limitation in the claim.

10. Claims 22-36 depend from claim 21 and contain all of the limitations of claim 21. Therefore, claims 22-36 are rejected for the same reasons as claim 21.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

12. Claims 12-20 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 7-233469 (JP '469).

13. For claim 12, Applicant requires a method of forming a film comprising sputtering a target. The sputtering target has a substrate and a target material formed on the substrate. The

target material had an oxygen deficient oxide as a main component. The oxide is TiO_x where $1<x<2$.

14. JP '469 discloses a method for forming a film comprising sputtering a target of TiO_x where $1<x<2$ (claim 5). The target is on a backing plate (Examples 8 to 11 and Comparative Examples 1 and 2).

15. For claim 13, Applicant requires the sputtering to be DC sputtering. JP '469 discloses that the process that the target is used in is a DC sputtering process (Examples 8 to 11 and Comparative Examples 1 and 2).

16. For claim 14, Applicant requires the target to have a resistivity of at most 10Ωcm. For claim 15, Applicant requires the resistivity to be at most 1Ωcm. JP '469 discloses that the resistivity of the target can be below 1Ωcm (Table 1).

17. For claim 16, Applicant requires the target to also have an oxide from a metal selected from Cr, Ce, Y, Si, Al, and B. JP '469 discloses that an additive of an oxide of Cr can be in the target (Table 3).

18. For claim 17, Applicant requires the additive oxide to be present in an amount of at most 20%. JP '469 discloses that the additional oxide can be present in an amount of 5% (Table 3).

19. For claim 18, Applicant requires the sputtering to occur in an atmosphere of argon and oxygen gas. JP '469 discloses that the sputtering can occur in an atmosphere of argon and oxygen (Examples 17 to 31).

20. For claim 19, Applicant requires the oxygen to be present in the mixed atmosphere of argon and oxygen to be in an amount of at most 30% by volume. JP '469 discloses that the oxygen in the sputtering gas can be present in an amount of 10% (Table 2).

21. For claim 20, Applicant requires the film to be formed to have a refractive index of 2.4. JP '469 discloses that the formed film can have a refractive index of 2.4 (Table 4).

22. Claims 12-15, 18, and 19 are rejected under 35 U.S.C. 102(a) as being anticipated by WO 97/25450 to Vanderstraeten.

23. Claims 12-15, 18, and 19 are described above in paragraphs 13, 15, 16, 19, and 20. Vanderstraeten discloses a process for coating a substrate surface (claim 1). The process involves DC sputtering a target of TiO_x with a resistivity of below 0.1 ohm.cm (claim 1). The target has a value of x in the range of 1.55 to 1.95 (page 3, l. 10-12). The sputtering occurs in an atmosphere of argon and oxygen where the oxygen content is 30-10% by volume (page 4, l. 24-28). The target is formed on a substrate (page 3, l. 17-23). The target material is formed on the substrate by plasma spraying (page 3, l. 30-35).

24. Claims 12-15 are rejected under 35 U.S.C. 102(a) as being anticipated by WO 97/25451 to Vanderstraeten (Vanderstraeten II).

25. Claims 12-15 have been described above in paragraphs 13, 15, and 16. Vanderstraeten II discloses a process for preparing a sputtering target (abstract). The target is used in a DC sputtering process (page 1, l. 6-12). The target used is TiO_x where x is in the range of 1.55 to 1.95 with a resistivity of 0.02 ohm.cm (page 3, l. 26-32).

Claim Rejections - 35 USC § 103

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

27. Claims 21-28, 30-34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 7-233469 (JP '469) in view of US 5,354,446 to Kida et al. (Kida).

28. For claim 21, Applicant requires a sputtering target with a substrate, target material formed on the substrate, and an undercoat between the target material and the substrate. The target material comprises an oxygen deficient oxide as a main component. The oxygen deficient oxide is TiO_x where $1<x<2$.

29. JP '469 is described above and discloses the backing plate and oxygen deficient oxide as the target material.

30. JP '469 does not disclose the use of an undercoat of metal between the target material and the substrate.

31. Kida discloses that an undercoat should be between the substrate and the target material to reduce the difference in thermal expansion between the lower layer and the target material (col. 6, l. 33-39). The backing plate can be copper (col. 6, l. 19-22). The target material can be titanium oxide (col. 5, l. 35-63).

32. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of JP '469 to utilize an undercoat as described in Kida between the substrate and the target material because of the desire to reduce the difference in thermal expansion.

33. For claim 22, Applicant requires the undercoat to have a thermal expansion coefficient between that of the target material and that of the substrate. Kida discloses that the underlayer should have a thermal expansion coefficient between that of the target and that of the substrate (col. 6, l. 39-49).

34. For claim 23, Applicant requires the undercoat to have two layers. The first layer is adjacent to the substrate and has a coefficient of thermal expansion between that of the target material and that of the substrate. The second layer is adjacent to the target material and has a thermal expansion coefficient within a range of $\pm 2x10^{-6}$/°C of the target material. Kida discloses that the underlayer can be two layers with the first layer adjacent to the substrate and with a coefficient of thermal expansion between that of the target material and that of the substrate. The second layer is adjacent to the target material and had a thermal expansion coefficient within a range of $\pm 2x10^{-6}$/°C of the target material (col. 6, l. 39-58).

35. For claim 24, Applicant requires the undercoat to have a material such as Mo. Kida discloses that the underlayer can comprise Mo (col. 6, l. 60).

36. For claim 25, Applicant requires that the undercoat has a thickness of 30-100μm. Kida discloses that the thickness can be 30-100μm (col. 6, l. 62-63).

37. For claim 26, Applicant requires the thermal expansion coefficient of the undercoat to be from $12x10^{-6}$ to $15x10^{-6}$/°C. Kida discloses that requires the thermal expansion coefficient of the undercoat to be from $12x10^{-6}$ to $15x10^{-6}$/°C (col. 7, l. 13-21).

38. For claim 27, Applicant requires the undercoat to have a thermal expansion coefficient within a range of $\pm 2x10^{-6}$/°C of the target material. As noted above, Kida discloses the limitation.

39. For claim 28, Applicant requires the thermal expansion coefficient of the undercoat to be from $4x10^{-6}$ to $11x10^{-6}$/°C. Kida discloses that the thermal expansion coefficient can be $5x10^{-6}$/°C (col. 7, l. 11).

40. For claim 30, Applicant requires the target to have a resistivity of at most 10Ωcm and for claim 31, a resistivity of at most 1Ωcm. As noted above, JP '469 discloses such a limitation.

41. For claim 32, Applicant requires the target material to have an oxide of at least one metal such as Mo. As noted above, JP '469 discloses such a limitation.

42. For claim 33, Applicant requires the oxide to have the oxide present in an amount of at most 20 wt%. As noted above, JP '469 discloses such a limitation.

43. For claim 34, Applicant requires a method of making a sputtering target comprising providing an undercoat on a substrate, depositing a target material on the undercoat, and forming the target of claim 21. As the target of claim 21 is obvious over JP '469 in view of Kida as mentioned above, the limitations of claim 34 are also taught by the references.

44. For claim 36, Applicant requires the method of using the target of claim 21. Such a limitation is obvious in light of the combination of JP '469 in view of Kida.

45. Claims 21-28, 30, 31, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/25450 to Vanderstraeten in view of US 5,354,446 to Kida et al. (Kida).

46. Claims 21-28, 30, 31, and 34, and 36 are described above in paragraphs 28 and 33-44. Claim 35 requires the target material to be deposited by plasma spraying. Vanderstraeten is described above but does not disclose the use of an underlayer. Kida is described above and discloses the use of an underlayer and the motivation for utilizing an underlayer as well as the characteristics of the thermal expansion coefficient of the underlayer in relation to the substrate and the target material.

47. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Vanderstraeten to utilize an undercoat as described in Kida between the substrate and the target material because of the desire to reduce the difference in thermal expansion. Therefore, the limitations of claims 21-28, 30, 31, and 34-36 are met.

48. Claims 21-28, 30, 31, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/25451 to Vanderstraeten (Vanderstraeten II) in view of US 5,354,446 to Kida et al. (Kida).

49. Claims 21-28, 30, 31, and 34-36 are described above in paragraphs 28 and 33-44. Claim 35 is described above in paragraph 46. Vanderstraeten II is described above but does not disclose the use of an underlayer. Kida is described above and discloses the use of an underlayer and the motivation for utilizing an underlayer as well as the characteristics of the thermal expansion coefficient of the underlayer in relation to the substrate and the target material.

50. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Vanderstraeten II to utilize an undercoat as described in Kida between the substrate and the target material because of the desire to reduce the difference in thermal expansion. Therefore, the limitations of claims 21-28, 30, 31, and 34-36 are met.

Double Patenting

55. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground

provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

56. Claims 12, 14, 16, 21, 22, 30, 32, and 34-36 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 5, 10-13, and 16 of U.S. Patent No. 6,193,856. Although the conflicting claims are not identical, they are not patentably distinct from each other because each of the limitations are disclosed in the claims of the patent.

57. Claims 23-29 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 5, 10-13, and 16 of U.S. Patent No. 6,193,856 in view of US 5,354,446 to Kida et al. (Kida). As noted above, Kida discloses the motivation for utilizing and undercoat and describes specific undercoat materials to be utilized between the target material and the substrate.

58. Claims 13, 15, 17-20, 31, and 33 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 5, 10-13, and 16 of U.S. Patent No. 6,193,856 in view of JP 7-233469 (JP '469). As noted above, JP '469 provides the teaching of having the resistivity below 1 ohm.cm and the oxygen content below 20 wt% as well as the specific materials for an additional oxide in the target with a non-stoichiometric titanium oxide main component.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473. The examiner can normally be reached on Mon - Thurs (7:30 AM - 5:00 PM) & alternate Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Steven H VerSteeg
Examiner
Art Unit 1753

shv
March 9, 2001